

10/517831

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
29 April 2004 (29.04.2004)

PCT

(10) International Publication Number
WO 2004/035991 A2

(51) International Patent Classification⁷:

F01D

(71) Applicants and

(21) International Application Number:

PCT/JP2003/013332

(22) International Filing Date: 17 October 2003 (17.10.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2002-304826

18 October 2002 (18.10.2002)

JP

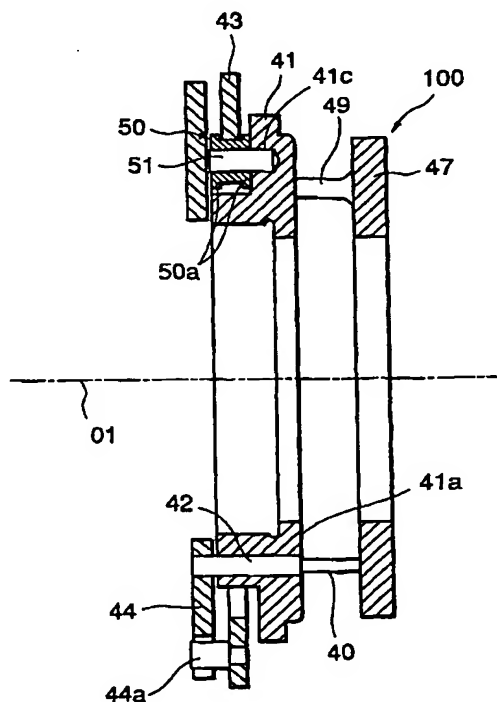
(74) Agent: TAKAHASHI, Masahisa; Room 1003, Ambassador Roppongi Buildings, 16-13, Roppongi 3-chome, Minato-ku, Tokyo 106-0032 (JP).

(71) Applicant (for all designated States except US): MITSUBISHI HEAVY INDUSTRIES, LTD. [JP/JP]; 16-5, Konan 2-chome, Minato-ku, Tokyo 108-8215 (JP).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,

[Continued on next page]

(54) Title: VARIABLE-NOZZLE MECHANISM, EXHAUST TURBOCHARGER EQUIPPED THEREWITH, AND METHOD OF MANUFACTURING EXHAUST TURBOCHARGER WITH THE VARIABLE-NOZZLE MECHANISM



(57) Abstract: An exhaust turbocharger with a variable-nozzle mechanism with fail-safe feature included is provided with which, even if wear of the drive ring supporting part where the supporting elements are in reciprocating sliding or rolling contact with each other under high temperature without lubrication increases, the drive ring can be supported on the nozzle mount on the second supporting part, which enables the drive ring to be always supported rightly on the nozzle mount, and to prevent the occurrence of eccentric rotation or dropping out of the drive ring due to excessive wear of the drive ring supporting part or the occurrence of reduction in engine performance due to malfunctions of the variable-nozzle mechanism such as the error in the relation between the output of the actuator and the nozzle vane opening or the occurrence of breakage of the variable-nozzle mechanism as has been experienced in prior arts.

WO 2004/035991 A2